MEETING ON MARCH 25, 1982
OBJECT — RS-232/Parallel peripheral

Notes for meeting on March 25, 1982 to discuss the following
issues on RS-232/Parallel peripheral:

1 — Theoretical configuration of RS-232: TERMINAL vs SET

2 — Physical way to bring parallel port signals outside

3 — Heat dissipation problem
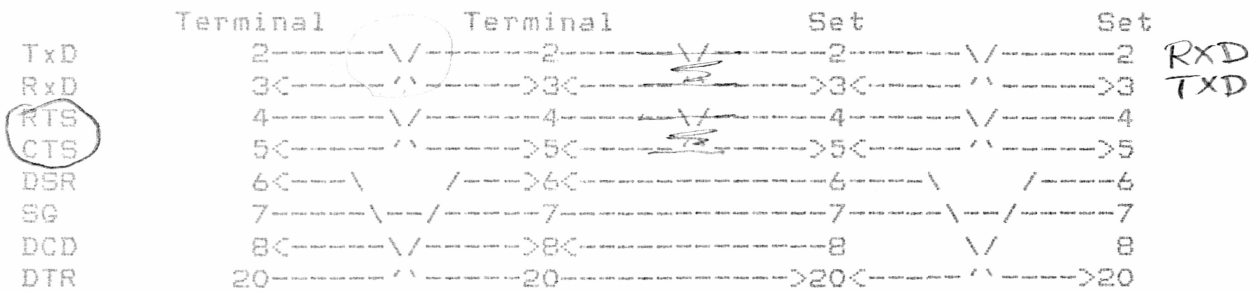
TERMINAL vs SET

Terminal - uses DTR as output and DSR and DCD as inputs;
Set   - uses DTR as input and DSR and DCD as outputs;

The following table shows the equipment which is currently
available and format it uses:

                                    MODEM.

| TERMINAL | SET |

APPLE I/O board	TI 99/4 RS-232
Printers - Epson	Printer - IDS-125
Seikosha	Modem - Novation CAT
Okidata	
Anadex	
Qume	
Comprint	
TI-810	

INTERFACES (standard):

        Terminal   Terminal   Set   Set
TxD   2-------\/-------2--------\/-------2------\/------2   RxD
RxD   3<------'\----->3<---------------->3<-----'\----->3   TXD
RTS   4-------\/-------4--------\/-------4------\/------4
CTS   5<------'\----->5<--------------->5<-----'\----->5
DSR   6<----\   /---->6<----------------6-----\   /----6
SG   7------\--/------7----------------7-----\--/------7
DCD   8<------\/----->8<----------------8   \/   8
DTR   20-------'\----->20--------------->20<----'\----->20
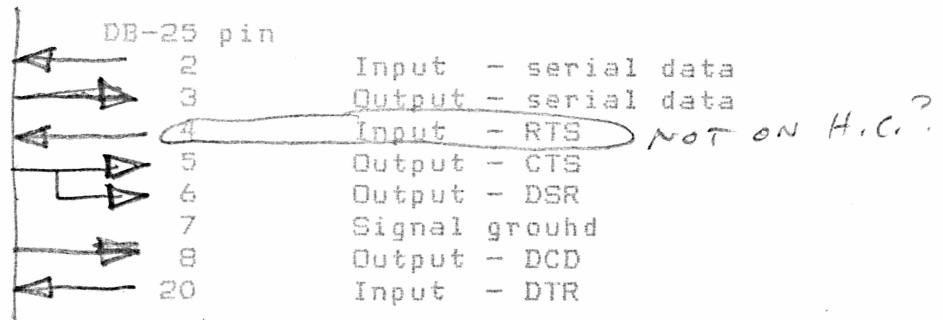
Note - APPLE I/O board interfaces like Terminal but ommits
       DSR line.

       TI 99/4 interfaces like Set but ommits RTS line,
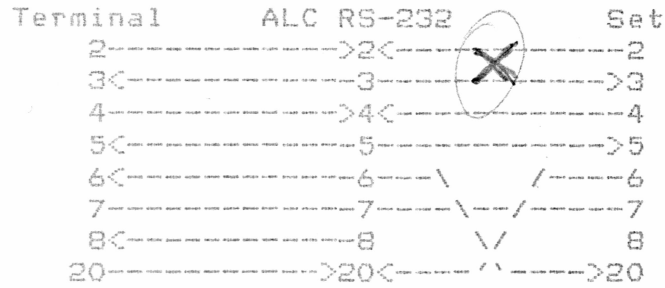   interchanges lines RxD and TxD, and uses CTS as output.
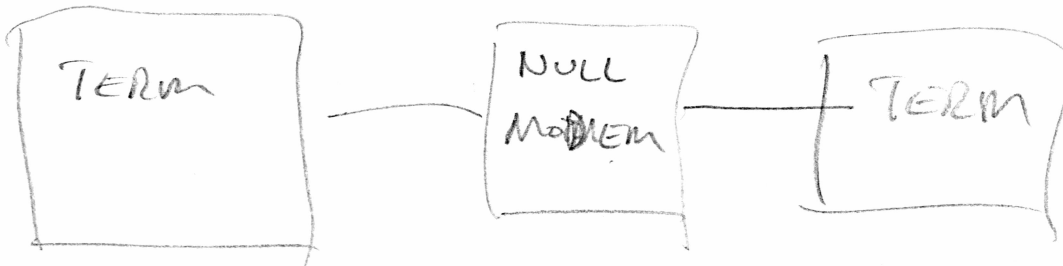
Proposed pinout for RS-232 port interfacing like Set:

ALC
RS232

```
         DB-25 pin
              2       Input   - serial data
              3       Output  - serial data
              4       Input   - RTS      NOT ON H.C.?
              5       Output  - CTS
              6       Output  - DSR
              7       Signal  grouhd
              8       Output  - DCD
             20       Input   - DTR
```

Interface:

```
    Terminal        ALC RS-232            Set
        2------------------->2<------X-------2
        3<------------------3----------X------->3
        4------------------->4<----------------4
        5<------------------5----------------->5
        6<------------------6----\    /----6
        7-------------------7----\--/----7
        8<------------------8       \/      8
       20------------------->20<-----/\---->20
```

The problems encountered with current implementation:

1 - Requirement for special cable to use with parallel port

2 - Some commercially available equipment provides connection
    for unused pins on RS-232 connector to high voltage or ground

Solutions:

1 - Stay with current implementation, provide special cable
    and apply restrictions on users

2 - Use special configuration inside the unit

3 - Use edge connector and provide special interface card

4 - Use of internal jumpers (requires 13 jumpers)

5 - Provide protection against undesirable voltages /

RS232 _____ PARALLEL _____ BOTH

DB25 FIXED

CABLE FROM INSIDE DIRECTLY TO PARALLEL.

Heat dissipation — the table below shows the power required
for the RS-232/Parallel peripheral:

Part	Ityp	Imax	Units
TMS-7000	80	190	mA
6551(UART)	35	60	mA
75189	20	26	mA
LED	22	25	mA
ASTEC(DC-DC)	160	260	mA
IOBC	3	10	mA
Power Supply (if internal)	100	150	mA
TOTAL	420	721	mA

110

Solutions:

Provide slots for air circulation.

$$.42 \times$$
$$\underline{5}$$
$$2|0$$

P3

B4	38	STR 9
DC	27	D-0 11
D1	26	D-1 12
D2	24	D-2 13
D3	23	D-3 14
D4	22	D-4 15
D5	21	D-5 16
D6	20	D-6 17
D7	19	D-7 18
INT3	12	ACK 19
A5	16	EKR 24
A6	15	BUSY 25
A7	11	SEL 10

U1

C2 XTAL1 18
X1
C3 XTAL2 17

R4 R5 R6 +V

S12 A0 6
A1 7
A2 8

+V
L2
R15
Q2 R14 B7 2

36 INC

Vcc RESET Vss
25   14   40
+V CR1
R3 C5

U2

C0	28	DB0 18
C1	29	DB1 19
C2	30	DB2 20
C3	31	DB3 21
C4	32	DB4 22
C5	33	DB5 23
C6	34	DB6 24
C7	35	DB7 25
B0	3	RS0 13
B1	4	RS1 11
B2	5	CS1 3
B3	1	R/W 22
B6	39	Φ-2 27
INT1	13	IRQ 26

Vcc C10 GND
15 2 1

TxD 10
RTS 8
RxD 12
CTS 9
DSR 17
DCD 16

U4 7
U5 6

+12 R16 DCD 8
RxD 3
CTS 5
DSR 6
TxD 2
RTS 4
DTR 20
J1

C8 C9 C10 C11 C12
7
1

X2 +V C6
VDD 22

U3

CS
RS
R/W
E
I/O-0
I/O-1
I/O-2
I/O-3
TRQ
RES
NRF DAC DB SC2 Vss

D0 12
D1 13
D2 14
D3 15
HSK 16
BAV 17

R7 R8 R9 R10 R11 R12 +V

P1
1
7
8
5
3
6
4

P2
1
2
7
8
5
3
6
4

+V R18

+V
L1
S-2
P4 R17 C1 U6 +12
-12
R1 R2

DIMENSION IDENT. NUMBERS
USED | NOT USED

TEXAS INSTRUMENTS
INCORPORATED
Lubbock, Texas

DWN T. Shrimon   DATE
ISSUE DATE
SIZE C FSCM NO
DRAWING NO RS-232-6551 REV
SCALE SHEET